

Chapter 11 - Inspection of Wire Enclosed Riprap – 02372

General:

Materials and procedures for wire enclosed riprap.

Related Sections:

02056: Common Fill

02075: Geotextiles

02316: Roadway Excavation

02324: Compaction

03211: Reinforcing Steel and Welded Wire

Checklist

1. Has material source been accepted?
2. Have material certifications been submitted for basket material?
3. Is rock angular, well graded, 10” minus in size, and free of seams or cracks?

Preparation of Sub Grade

1. Remove all brush, trees, stumps, and other objectionable materials.
2. Provide a firm foundation that is uniform to line and grade.
3. If required, provide geotextile separation fabric.

Building of Baskets

1. Secure all perimeter edges with lacing wire.
2. Tightly loop binding wire around every other mesh opening along the seams, alternating single and double loops.
3. Place a diaphragm of the same mesh and gauge as the body of the wire basket module when the length of the basket exceeds one and one half times its horizontal width. Divide the diaphragms into cells whose lengths do not exceed the horizontal widths of the basket.

4. Protect the wires from being broken.

Filling the Baskets

1. Use a loading frame if needed to prevent damage to the wire baskets.
2. If needed, hand place stone around outer edges so as not to lose smaller gradation of stones through the openings in mesh.
3. Secure lid of baskets in same manner of tying as the assembly of the walls.

Placement of Baskets

1. Begin assembly and stone placement at the lowest layer or row.
2. Tie each subsequent layer or row to the one below and adjoining structure
3. Use wire equal to that required for selvaqe wire.
4. Install anchors according to manufacturer's recommendations.

WIRE ENCLOSED RIPRAP			
SPEC	INSPECTION LEVEL	INSPECTION OBJECTIVE	INSPECTOR ACTIVITY
02372	Submittals	Ensure that samples/ submittals are in for rock source, Wear and Soundness tests.	Check with lab / office
		Ensure that cert's are in for baskets	Get cert's from contractor
02372	Subgrade Prep.	Provide a firm subgrade	Visual inspection & documentation
02372	Intermittent	Ensure proper assembly and installation of baskets and quality of rock.	Visual Inspection & documentaion

Chapter Eleven - Inspection of Riprap – 02373

General:

Materials and procedures for placing loose riprap, hand placed riprap, compacted riprap, and plated riprap.

Related Sections:

02075: Geotextiles

Checklist

1. Has material source been accepted?
2. Is rock angular, well graded, and free of seams or cracks?

Preparation of Sub Grade

1. Remove all brush, trees, stumps, and other objectionable materials.
2. Provide a firm foundation that is uniform to line and grade.
3. If required, provide geotextile separation fabric.

Loose Riprap

1. Distribute and manipulate the stones in a manner that the larger rock fragments are uniformly distributed and that the smaller rock fragments fill the space between the larger fragments.
2. Ensure that the toe of the slope is embedded to protect against undercutting.

Hand-Placed Riprap

1. Place and bed the stones keying them together and filling irregularities between the stones with suitable size stones that are tight in place.
2. Provide a uniform surface when complete.
3. Embed riprap below the ground.

Compacted Riprap

Compact properly placed loose riprap that is free of any protrusions greater than 3" in height.

Plated Riprap

1. Compact properly placed loose riprap by repeatedly striking the surface with a steel plate, approximately 5' x 5' and weighing approximately 6000 lbs, and dropping from a height of 3-5 feet.
2. Compaction is complete when a uniform surface is free of protrusions greater than 4 inches.

RIPRAP			
SPEC	INSPECTION LEVEL	INSPECTION OBJECTIVE	INSPECTOR ACTIVITY
02373	Submittals	Ensure that samples/ submittals are in for rock source, Wear and Soundness tests.	Check with lab / office
		Ensure that cert's are in for geotextile fabric.	Obtain cert's from contractor
02373	Subgrade Prep.	Provide a firm subgrade	Visual inspection & documentation
02373	Intermittent	Ensure proper installation of rock and quality of rock	Visual Inspection & documentaion

Chapter 11 -Grouted Riprap – 02374

General:

Materials requirements and procedures for furnishing, transporting, and installing of grouted riprap and all related materials.

Related Sections:

03055: Portland Cement Concrete

Checklist

1. Has material source been accepted?
2. Samples for quality assurance
3. Grout mix design
4. Free of clay or similar material

Preparation

1. Install surface and ground water control measures to ensure dry conditions to work in.
2. Remove all topsoil, loose excavated materials, vegetative debris, concrete debris, and other objectionable materials from beneath the areas where the grouted riprap is to be placed.
3. Make sure natural drainage areas are not compromised.
4. Compact sub grade to 95 % of a T-99 Proctor, or 70% of a T-180 Proctor.
5. Install a free draining bedding layer around the weep drains and provide sufficient cover to prevent crushing.

Placement of Bedding Materials

1. Overlap geotextile fabric a minimum of 18".
2. Overlap the upstream geotextile over the downstream layer.
3. Check for damage to the geotextile.
4. Maintain 3" minimum bedding aggregate over fabric.

Placement of Riprap Materials

1. Distribute large stones uniformly to provide adequate access for the grout to the lower portions of the stone to prevent voids from forming.
2. Check for minimum thickness and height indicated.
3. Remove any stones protruding more than 10% of the stone layer thickness.
4. Begin placing stones at the lowest point.
5. Provide 3" diameter pipe weep holes penetrating the bedding with an average spacing of not more than 10 feet on center at the toe of the slopes.
6. Form all outer edges so that they are even with the adjacent slope or ground.

Riprap Grouting

1. Do not place grout when temperature is less than 40 degrees F.
2. Maintain minimum of 50 degrees F. and maximum 90 degrees F. during placement and curing period.
3. Do not place on frozen surface
4. Cover and heat the stones between 50 degrees F and 90 degrees F for 24 hours prior to grouting when temperature is to drop below 40 degrees F.
5. Thoroughly wet riprap to a saturated surface condition.
6. Inject grout with a low pressure 2" max hose.
7. Place grout from bottom to top between stones leaving no voids. Grout must penetrate to the subgrade.
8. Use a "pencil" vibrator to fill all voids between and under stones
9. Leave top of stones fully exposed
10. Remove all excess grout immediately
11. Construct the grouted riprap to have a rustic appearance

Curing and Protection

Keep all exposed surfaces continuously moist for 7 days and protect from becoming damaged.

GROUTED RIPRAP			
SPEC	INSPECTION LEVEL	INSPECTION OBJECTIVE	INSPECTOR ACTIVITY
02374	Submittals	Ensure that samples/ submittals are in for rock source, Wear, Soundness tests, and grout mix design	Check with lab / office
02374	Subgrade Prep.	Ensure that cert's are in for all other materials. Provide a compacted subgrade, 95% of a T-99 proctor	Obtain cert's from contractor Perform density test and documentation
02374	Intermittent	Proper installation of fabric, rock, and grout.	Visual inspection and documentation

RIP RAP – Check List

Confirming	Attributes
YES () NO () N/A ()	Reviewed assigned functions and then reviewed the contract plans, specifications, and special provisions, noting all provisions applicable to the assigned responsibilities.
YES () NO () N/A ()	Contractor has submitted data showing riprap source gradation, ware and soundness and placement technique 10 days before use.
YES () NO () N/A ()	Contractor has submitted a sample for <u>Quality Assurance Testing</u> before use.
YES () NO () N/A ()	All brush, trees, stumps and other objectionable materials have been removed
YES () NO () N/A ()	Provide a firm foundation by excavating to a dressed uniform surface conforming to the lines and grades shown in the plans
YES () NO () N/A ()	Ensure that any Geotextile or Wire has a Certificate of Compliance before placement.
YES () NO () N/A ()	Complete the Measurement of payment for this Item and have completed Measurement and Documented these measurements.
YES () NO () N/A ()	Completed a Daily Diary on all events for the day.
YES () NO () N/A ()	Have reviewed all documentation / Certifications and handed all information into the Resident Engineers office.

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